Questions and Answers about Dioxins July 2000

The following questions and answers provide general information about dioxins, a subject that can be complex and confusing. The information presented here discusses possible effects of dioxin exposure in humans and includes advice about consumption of food that might contain dioxins. It also provides background about a draft report on dioxins (also called the dioxin reassessment) recently released by the Environmental Protection Agency, and explains the process for reviewing the report before it is finalized. The reader should keep in mind that the draft EPA dioxins report is currently undergoing a thorough independent scientific peer review, and it will be carefully evaluated before any actions based on the report's findings are undertaken. The questions and answers provided here are not meant to comment on the EPA report and should in no way be taken to indicate that the analysis or conclusions of the draft EPA dioxins report are final.

The questions and answers in this document were prepared by the Interagency Working Group on Dioxin consisting of representatives from the following federal agencies:

- Department of Health and Human Services (DHHS)
  - Food and Drug Administration (FDA)
  - Agency for Toxic Substances and Disease Registry (ATSDR)
  - Centers for Disease Control and Prevention (CDC)
  - National Institute of Environmental Health Sciences (NIEHS)
- Department of Agriculture (USDA)
  - Food Safety Inspection Service (FSIS)
  - Agricultural Research Service (ARS)
- Department of Veterans Affairs (DVA)
- Environmental Protection Agency (EPA)
- Department of Commerce
  - National Marine Fisheries Service (NMFS)
- Department of State
- White House Office of Science and Technology Policy (OSTP)

The questions and answers are presented in four sections;

1. General information about dioxins
2. Overview of the EPA dioxins report
3. Food safety questions and answers
4. Risk assessment questions and answers

General information about dioxins

In this section background information about dioxins is provided to help those who would like a basic understanding of what dioxins are.

Overview of the EPA dioxins report

In this section EPA describes what is in the draft Dioxin Reassessment Documents (referred to as EPA's *draft dioxins report*). EPA also describes the review process leading to finalization of that report.

Food safety questions and answers

This section answers questions dealing with food safety issues from a multi-agency federal government perspective, including input from DHHS (FDA, CDC, ATSDR, NIEHS), USDA (FSIS and ARS), DVA, NMFS, OSTP, and EPA.

Risk assessment questions and answers

This section answers questions dealing with general risk assessment issues relevant to the EPA draft dioxins report. The questions are addressed from a "multi-agency" federal government perspective, including input from DHHS (FDA, CDC, ATSDR), USDA, and EPA.

General information about dioxins (return to list)

G1. What are dioxins? (return to list)

"Dioxins" refers to a group of chemical compounds that share certain similar chemical structures and biological characteristics. Several hundred of these toxic compounds exist and are members of three closely related families: the chlorinated dibenzo-*p*-dioxins (CDDs), chlorinated dibenzofurans (CDFs) and certain polychlorinated biphenyls (PCBs). Sometimes the term dioxin is also used to refer to the most well-studied and one of the most toxic dioxins, 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD). CDDs and CDFs are not created intentionally, but are produced inadvertently by a number of human activities. CDDs and CDFs are also produced by natural processes. PCBs are man-made, but are no longer produced in the U.S.

Dioxins are released into the air from combustion processes such as commercial or municipal waste incineration and from burning fuels (like wood, coal or oil). Dioxins can also be formed when household trash is burned and during forest fires. Chlorine bleaching of pulp and paper, certain types of chemical manufacturing and processing, and other industrial processes all can create small quantities of dioxins. Cigarette smoke also contains small amounts of dioxins.

Over the past decade, EPA and industry have worked together to dramatically reduce dioxin emissions. Because dioxins are extremely persistent compounds, levels of dioxins still exist in the environment from both man-made and natural sources and will take years to decline. A large part of the current exposures to dioxins in the U.S. are due to man-made dioxins from releases that occurred in the past, even decades ago. Even if all human-generated dioxins could somehow be eliminated, low levels of naturally produced dioxins will remain. EPA is continuing to look for ways to reduce dioxin levels entering the environment and to reduce human exposure to them.

G2. Why are people concerned about dioxins? (return to list)

Scientists and health experts are concerned about dioxins because studies have shown that exposure to them may cause a number of adverse health effects. Because dioxins exist throughout the environment, almost every living creature including humans has been exposed to dioxins. The health effects associated with dioxins depend on a variety of factors including: the level of exposure, when someone was exposed, and how long and how often. Because dioxins are so widespread, we all have some level of dioxins in our bodies.

The most noted health effect in people exposed to large amounts of dioxin is chloracne. Chloracne is a severe skin disease with acne-like lesions that occur mainly on the face and upper body. Other effects of exposure to large amounts of dioxin include skin rashes, skin discoloration, excessive body hair, and possibly mild liver damage.

One of the main health effects of concern for dioxins is cancer in adults. Several studies suggest that workers who were exposed to high levels of dioxins at their workplace over many years have an increased risk of cancer. Animal studies have also shown an increased risk of cancer from long term exposure to dioxins.

Finally, although not seen in human studies, based on data from animal studies there is also some concern that exposure to low levels of dioxins over long periods (or high level exposures at sensitive times) might result in reproductive or developmental effects. These could include weakened immune responses and behavior changes in offspring.

G3. What happens to dioxins when they enter the environment? (return to list)

When released into the air, some dioxins may be transported long distances. Because of this, dioxins are found in most places in the world. When dioxins are released into water, they tend to settle into sediments where they can be further transported or ingested by fish and other aquatic organisms. Dioxins are broken down in the environment very slowly and can be deposited on plants and taken up by animals and aquatic organisms. Dioxins may be concentrated in the food chain so that animals have higher concentrations than plants, water, soil, or sediments. Within animals, dioxins tend to accumulate in fat.

G4. How might I be exposed to dioxins? (return to list)

Most of the population has low level exposure to dioxins. EPA estimates that most dioxin exposure occurs through the diet, with over 95% coming through dietary intake of animal fats. Small amounts of exposure occur from breathing air containing trace amounts of dioxins on particles and in vapor form, from inadvertent ingestion of soil containing dioxins, and from absorption through the skin contacting air, soil, or water containing minute levels.

Some people may have higher exposures than the general population. They may have experienced elevated exposures to dioxins as a result of particular food contamination incidents, through workplace exposures, from industrial accidents, or from consumption of unusually high amounts of fish, meat, or dairy products containing elevated levels of dioxins.

G5. Do all dioxin compounds pose the same amount of danger? (return to list)

No. Different dioxin compounds have different toxicities and dioxins are most often found in mixtures rather than as single compounds in the environment. The most toxic forms of dioxin are 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD. Scientists use a shorthand method for comparing the toxicity of different types or mixtures of dioxins to the toxicity of 2,3,7,8- TCDD and 1,2,3,7,8-PeCDD. This method is called the "Toxicity Equivalence" or TEQ.

G6. Will all the dioxin be gone from the environment soon? (return to list)

No. Although dioxin levels in the United States environment have been declining for the last 30 years due to reductions in man-made sources, dioxins break down so slowly that some of the dioxins from past releases will still be in the environment many years from now. Dioxins that remain in the environment from of past releases are sometimes called "reservoir sources" of dioxins. While reductions in remaining man-made sources will help environmental dioxin levels go down even further, there will still be some dioxins from reservoir sources for many years. Because of natural processes, dioxin levels in the environment will never go to zero.

Based on recent measurements in a few states, it appears that levels in our bodies are going down too. We expect dioxin levels in our bodies to keep going down, but because of the significant role of reservoir sources, levels will likely remain elevated for many decades. Because of background occurrence of dioxin in the environment, the levels will never go to zero.

G7. What is meant by "natural background" and "current background" for dioxins? (return to list)

Dioxins are produced by natural processes, although at much lower levels than are produced by man. The term "natural background" for dioxins refers to the dioxins that are in the environment because of these natural processes. We do not know what the natural background level of dioxins is. The term "current background" refers to the level of dioxin in the environment today. Current background is primarily made up of dioxins from man-made sources.

G8. What are the major sources of dioxins? (return to list)

The amounts of dioxin that have been released from various sources have changed significantly over time. Historically, commercial or municipal waste incineration, manufacture and use of certain herbicides and chlorine bleaching of pulp and paper resulted in the major releases of dioxins to air and water. Regulatory actions along with voluntary industry actions have resulted in dramatic reductions in each of these sources and they are no longer major contributors of dioxins to the environment in the United States. While the United States has taken action to control this type of emission, these sources of dioxin still occur in the world. Currently, the uncontrolled burning of residential waste and accidental fires at landfills are thought to be among the largest sources of dioxins to the environment in the U.S.

G9. How long has dioxin exposure existed? (return to list)

Dioxins have been around for a long time. There are even natural sources for dioxins like forest fires and volcanoes, although natural sources contribute little to the current background dioxin levels. In the 1920's, as a consequence of industrialization, dioxin levels began increasing in the global environment. Declines in environmental levels began in the 1970's when dioxins were first recognized as highly toxic chemicals and actions to prevent environmental pollution were taken by governments and industry.

EPA's draft dioxins report does not state that there are more dioxins in the environment than before, but that dioxins may be more harmful than we previously thought.

G10. What is EPA doing to control dioxin releases into the environment? (return to list)

Over the last 20 years, EPA has aggressively looked for ways to reduce and control dioxins in all environmental media in the United States. Collectively, these actions have resulted in strict controls on all of the known major industrial sources of dioxin. As a result of EPA's efforts, along with efforts by state government and private industry, known industrial emissions in the United States will be reduced by more than 90% from 1980 levels within the next year or so. For example, municipal waste combustors are estimated to have emitted nearly 18 pounds of dioxin toxic equivalents in 1987. By 2002 municipal combustor emissions are expected to be less than 1/2 ounce per year. Similarly, medical waste

incinerators emitted about 5 pounds of dioxin equivalents in 1987 but under EPA regulations they will be limited to about 1/4 ounce annual emissions by 2002. EPA has implemented similarly strict standards for other dioxin sources.

Once the dioxin reassessment peer review process is completed and the document is finalized, EPA will release an Agency-wide dioxins strategy to address the findings of the final document. This strategy will be published for public comment. Further information regarding EPA efforts to reduce dioxin emissions and develop a comprehensive strategy can be found in the fact sheets available on the Internet at www.epa.gov/ncea/dioxin.htm.

G11. Should I (or can I) find out what my dioxin levels are? (return to list)

We do not recommend dioxin testing. Tests for measuring dioxin levels in humans are not routinely available. Those laboratories that do offer dioxin testing are generally not certified for that testing (as is required for clinical laboratories doing medical testing). Furthermore, their detection levels may not be low enough to detect dioxin levels that occur in the general population.

G12. How can I reduce my personal dioxin levels? (return to list)

We recognize people's concern over their potential dioxin exposure. Dioxins have existed in our environment for a long time. We all have some levels of dioxins in our bodies. Unfortunately, there are no safe and effective treatments to get rid of dioxins that may be in your body now. Dioxins are metabolized slowly (over years), and if exposure is sufficiently reduced then levels will go down over time. The best way to reduce your personal dioxins level (and your risk from dioxins) is to reduce exposure and intake of dioxins.

For most people, following existing Federal Dietary Guidelines will result in reduced fat consumption and, consequently, reduced dioxins exposure (see question G4). The dietary guidelines provide for moderate amounts of fats which are part of a balanced diet. Eliminating all fats is not recommended. Overall, the best strategy for lowering the risk of dioxins while maintaining the benefits of a good diet is to follow the recommendations in the Federal Dietary Guidelines to choose fish, lean meat, poultry, and low or fat free (skim) dairy products and to increase consumption of fruits, vegetables and grain products. Lean meat includes meats that are naturally lower in fat, and meat where visible fat has been trimmed. For fish and poultry you can reduce fat by removing the skin. Reducing the amount of butter or lard used in the preparation of foods and cooking methods that reduce fat (such as broiling) will also lower the risk of exposure to dioxins. These strategies help lower the intake of saturated fats as well as reduce the risk of exposure to dioxin.

For information on the Federal Dietary Guidelines see www.health.gov/dietaryguidelines/.

Overview of the EPA dioxins report (return to list)

The U.S. Environmental Protection Agency's (EPA) is in the process of completing a major scientific report entitled, "*Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds."* This report is commonly referred to as the EPA dioxin reassessment. We also refer to the dioxin reassessment as the EPA "dioxin report" in these questions and answers.

In April 1991, EPA announced that it would conduct a scientific reassessment of the health risks of exposure to dioxin and dioxin-like compounds. EPA decided to perform this reassessment because of significant advances in the scientific understanding of dioxin toxicity and significant new studies on its potential adverse health effects. EPA's initial assessment of dioxin was published in 1985.

In 1994, EPA completed a draft of the dioxin reassessment and submitted it to the EPA's Science Advisory Board (SAB) for review. The SAB recommended revision of two draft sections of the dioxin reassessment -- the dioxin risk characterization and the dose-response modeling chapter -- and the development of a new section on dioxin toxicity equivalence factors (TEF). Because of the complexity of the science issues related to dioxin, the SAB recommended that these three sections undergo an additional level of review by independent external peer reviewers prior to being brought back to the SAB for review. This independent external peer review provides an additional level of scrutiny and will serve to improve the scientific credibility of the dioxin reassessment. Following the independent external review, the SAB must review these same three chapters. SAB approval is required to produce a final EPA dioxin reassessment report. EPA will not use the conclusions of the draft dioxin reassessment for regulatory purposes until all the science peer reviews are completed.

O1. What will be the contents of the final dioxin report? (return to list)

EPA expects that the final dioxin reassessment will consist of three parts. *Part I: Estimating Exposure to Dioxin-Like Compounds* will include four volumes that focus on sources, levels of dioxin-like compounds in environmental media, and human exposures. *Part II: Health Assessment for 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds* will consist of two volumes that include information on critical human health end points, mode of action, pharmacokinetics, dose-response, and TEFs. Part II will have nine chapters. *Part III: Integrated Summary and Risk Characterization for 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds* is intended as a stand alone document. Part III summarizes the overall conclusions of the reassessment. In this part, key findings pertinent to understanding the potential hazards and risks of dioxins are described including a discussion of all important assumptions and uncertainties.

O2. What is the status of the two sections of the dioxin reassessment that are being revised and the new section on Toxicity Equivalence Factors (TEFs)? (return to list)

The two sections for which the SAB recommended revision, independent external peer review, and re-review by the SAB, are

Part II. Chapter 8: Dose-Response Modeling for 2,3,7,8-TCDD and

Part III: Integrated Summary and Risk Characterization for 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds (formerly identified as Chapter 9 in the 1994 draft dioxin reassessment).

The new draft TEF chapter is entitled, Part II. Chapter 9: Toxicity Equivalence Factors (TEF) for Dioxin and Related Compounds. The independent external peer review, as well as public comment, on the revised Chapter 8: Dose-Response Modeling occurred in March 1997. This chapter has been revised and will be submitted to the SAB for re-review.

The new TEF chapter and the revised Integrated Summary and Risk Characterization are currently undergoing independent external peer review. A workshop for the independent external peer review, open to the public, will be held on July 25 and 26, 2000. These two documents are also undergoing public review and comment, which means that the public can provide comments for EPA to consider prior to the SAB review.

Following the workshop, EPA will revise the draft documents based on independent external peer review comments and public comments. The TEF chapter and the Integrated Summary and Risk Characterization, along with the revised Dose-Response Modeling chapter, will then be submitted to the SAB for review. The SAB review is expected to occur in Fall 2000.

For more detailed information on the review process for the EPA dioxin report, please visit http://www.epa.gov/ncea/pdfs/dioxin/factsheets/dioxin_proc.pdf

O3. What is independent external peer review? (return to list)

External peer review is the process of having independent scientists in the appropriate fields review a scientific document prepared by another organization. The external peer review process is intended to assure that the scientific process followed was credible and that the conclusions drawn are considered appropriate.

O4. Who wrote the dioxins report? (return to list)

EPA's National Center for Environmental Assessment (NCEA), a part of the Office of Research and Development of EPA, is the group heading up the dioxin reassessment. The draft dioxin reassessment was developed over many years with the participation of scientific experts in EPA, the National Institutes of Health's National Institute of Environmental Health

Sciences, and other federal agencies, as well as scientific experts in the private sector and academia.

O5. Why did it take EPA 9 years to develop the dioxin reassessment to this point?
(return to list)

Completion of the final dioxin report has taken much longer than expected. It took four years to produce the first report which was thoroughly reviewed by EPA's Science Advisory Board (SAB) in May 1995. EPA received the SAB's report of their review in the Fall of 1995 which contained substantive and complex comments and recommendations representing a range of views on the health issues associated with dioxin exposures. In addition, since the 1994 draft reassessment report, important new scientific findings have been made that significantly add to the understanding of the complex mechanisms of action for dioxin. EPA had to analyze this new complex scientific research throughout the report. There has also been quite a lot of controversy over the toxicity of dioxins, and comments have been received from many members of the scientific community and the public. EPA has attempted to respond to these comments in the draft reassessment.

O6. How can I get a copy of the external review drafts? (return to list)

INTERNET The external review drafts of the TEF chapter and Integrated Summary and Risk Characterization are available to the public on the Internet website of the National Center for Environmental Assessment (NCEA) in EPA's Office of Research and Development at http://www.epa.gov/ncea/dioxin.htm. These documents can be viewed and downloaded from the Internet for review and comment. Background information is also available at the same site including other draft final chapters of the reassessment, specifically Part I: Estimating Exposure to Dioxin-Like Compounds (Volumes 2-4) and Part II: Health Assessment for 2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin (TCDD) and Related Compounds (Chapters 1-8).

PAPER COPIES AND CD-ROM -- Paper copies of both external review drafts and a Compact Disk-Read Only Memory (CD-ROM) that contains the external review draft of the TEF chapter and the background information [Part I: Estimating Exposure to Dioxin-Like Compounds (Volumes 2-4) and Part II: Health Assessment for 2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin (TCDD) and Related Compounds (Chapters 1-8)], are available from EPA's National Service Center for Environmental Publications (NSCEP) in Cincinnati, Ohio (telephone: 1-800-490-9198, or 513-489-8190; facsimile 513-489-8695).

To request copies, please provide your name, mailing address, and EPA document number.

1) Dioxin CD-ROM; **Document number EPA/600/P-00/001Ab-Ae**
2) Part II. Chapter 9: ; **Document number EPA/600/P-00/001Af**
3) Part III. Integrated Summary and Risk Characterization for 2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin (TCDD) and Related Compounds; **Document number EPA/600/P-00/001Ag**

O7. Where can I get more information on the draft dioxins report? (return to list)

EPA recognizes that the public may have many questions about this extensive draft report. Five fact sheets have been developed to help answer these questions. The general topics of these fact sheets are: 1) a brief summary of the reassessment, 2) a longer and more technical summary; 3) a summary of the reassessment process and the steps involved for EPA to complete the reassessment; 4) a summary of major EPA dioxin control efforts to date; and 5) information on EPA's Cross Media Dioxin Strategy which will integrate dioxin activities across all EPA programs. The five facts sheets are available on the Internet at www.epa.gov/ncea/dioxin.htm. Paper copies of these five fact sheets are also available from NCEA's Technical Information Staff at 202-564-3261. If you are requesting a copy of the fact sheets, please provide your name, mailing address, and reference the "Dioxin Fact Sheets."

O8. How can I find out more about this? (return to list)

On Monday, June 12, 2000, a public notice was published in the *Federal Register* (Federal Register, Vol.65, No.113 pp.36898-36900) , announcing: 1) the peer review workshop; 2) the availability of the review documents; and 3) the start of the public comment period.

O9. I don't have access to the *Federal Register*, so how will I know how to get a copy of the documents and find out about the independent external peer review workshop? (return to list)

The Monday, June 12 *Federal Register* notice is on the Internet. The *Federal Register* notice is linked to the dioxin website at www.epa.gov/ncea/dioxin.htm. The dates of the external peer review are July 25 and 26, 2000.

Food safety questions and answers (return to list)

We have been concerned about dioxins in foods since the 1980's and have been increasing monitoring over the past several years. The presence of dioxins in foods is not new nor is it unique to the US food supply. Because dioxins, when they were found in foods, were found at extremely low levels, it was not possible to routinely measure them with the monitoring methods that existed even a decade ago. Improvements in methods have allowed us to detect lower levels, and have allowed us to monitor dioxin levels in more foods. FDA and FSIS are exploring ways to address these issues in collaboration with EPA, including broadening the existing monitoring program for dioxins in the U.S. food and feed supply, and identifying new opportunities to reduce dietary exposures. We are encouraged by the fact that dioxins emissions from major industrial sources have been reduced dramatically by federal, state and industry efforts over the last ten years and that environmental levels have been going down since the early 1970's. While we have been successful in dramatically reducing dioxins emissions, we are continuing our efforts to reduce dioxin levels even further both in the environment and in foods.

F1. Is the food supply safe? (return to list)

The U.S. food supply is among the safest and most nutritious in the world. While we are concerned about dioxins, the draft report does not change our view of the overall safety of the food supply. Maintaining the safety of our food supply is our number one priority.

F2. Should I stop eating particular foods - such as meat, milk, fish, etc? (return to list)

No, we do not recommend avoiding particular foods because of dioxins. The draft dioxin report from EPA indicates that following the advice in the Dietary Guidelines for Americans will also help individuals lower their risk of exposure to dioxins. These guidelines include the recommendations to choose meat and dairy products that are lean, low fat, or fat free and to increase consumption of fruits, vegetable, and grain products. Meat, milk, and fish are important sources of nutrients for the American public and an appropriate part of a balanced diet. Milk is a major source of calcium, vitamins A and D, and riboflavin; meat is an important source of iron, zinc and several B-vitamins; fish provides beneficial fatty acids as well as certain vitamins and minerals. Each of these foods provides high quality protein in the diet. Lean meat includes meats that are naturally lower in fat, and meat where visible fat has been trimmed. For fish and poultry you can reduce fat by removing the skin. Reducing the amount of butter or lard used in the preparation of foods and cooking methods that reduce fat (such as broiling) will also reduce your fat intake. These strategies help lower the intake of saturated fats as well as reduce the risk of exposure to dioxins.

For information on the Federal Dietary Guidelines see www.health.gov/dietaryguidelines/.

You should of course pay attention to local fishing advisories for fish that you catch yourself. Fishing advisories may exist that provide recommended consumption rates of particular kinds of fish from particular water bodies where local contamination has occurred. If you don't know whether a water body that you fish in is covered under a fishing advisory, call your local or state health or environmental protection department and ask for their advice. (They are listed in the blue pages of your local telephone directory.) Ask them if there are any advisories on the kinds or sizes of fish that should not be eaten from the water body. You can also ask about fishing advisories at local sporting goods or bait shops where fishing licenses are sold.

F3. Should I avoid all fats? (return to list)

No. We need a certain amount of fat for a healthy, balanced diet. Fats supply energy and essential fatty acids, and they help the body absorb fat-soluble vitamins (A, D, E, and K). You need some fat in the food you eat. The federal Dietary Guidelines recommend that fat intake be no more than 30% of your total energy intake, with no more than 10% coming from saturated fats. For a person who consumes 2000 calories this means a total fat intake of 65 grams, including 20 grams or less of saturated fat. See the Nutrition Facts Label on food products for more information on fat content of food items. So again, we need a certain amount of fat for a healthy balanced diet. The Dietary Guidelines do not recommend that you avoid all fats but encourage reduction of saturated fat intake by choosing lean meats and low

or fat-free dairy products and by reducing the use of spreads or cooking fat made from animal fat. This advice regarding saturated fats is consistent with a strategy to reduce the risk of dioxin exposure. If you reduce saturated fat intake you also reduce risk for dioxin exposure.

For information on the Nutrition Facts Labels see http://vm.cfsan.fda.gov/label.html.

F4. Can I cook the dioxins out? Or wash them off? (return to list)

Good food safety practices like washing food and rinsing countertops will reduce risk from bacterial infection, but they can not reduce dioxin levels. Cooking methods that reduce fat in the food you eat (such as trimming fat and broiling) may also help to reduce dioxin exposure.

F5. How does the government monitor food for dioxins? (return to list)

The government monitors foods that are potential dietary sources of dioxins, primarily foods that contain animal fat. The goal of this monitoring is to find any unusually high dioxin levels and then work to determine the dioxin sources for those high levels so that they can be controlled.

F6. What kinds of foods are tested, how often, and in how many locations? (return to list)

Since about 1995, dioxins monitoring has involved several hundred samples a year, primarily of fish and dairy products from grocery stores and distribution centers across the country. To date the FDA monitoring of dairy products and fish shows that when detectable levels are found they are generally consistent with EPA estimates for background occurrence of dioxins. FSIS and EPA have also recently monitored for dioxins in a similar number of beef, pork, and poultry samples from across the country. We focused our monitoring on these foods because they are the foods in which dioxins are most likely to be found. In the past our ability to monitor has been limited by the fact that when dioxins do occur in foods, they occur at low levels that are hard to detect. Recent improvements in dioxin testing methods have allowed us to expand our monitoring efforts. We can now test more foods on a yearly basis. In addition, as a result of past monitoring we've discovered the importance of focusing on animal feeds, and so we are beginning to monitor animal feeds that may contribute to the dioxin levels in some foods.

Last year FDA started monitoring for dioxins in 200 of the most commonly eaten foods, as part of FDA's Total Diet Study (TDS). TDS is a yearly program that determines levels of various pesticide residues, contaminants, and nutrients in foods. In addition to the TDS, we are exploring options to do additional annual monitoring of the foods most likely to be dietary sources of dioxins, and to begin annual monitoring of the animal feeds most likely to contain dioxins.

For more information about FDA's TDS see http://vm.cfsan.fda.gov/~comm/tds-toc.html

F7. How do levels of dioxin now found in food compare to the incidents of dioxin contamination that have been in the news in the last several years? (return to list)

There were two incidents in the last 3 years that received national attention. In both incidents the dioxin levels were higher than background levels typically seen in foods tested by FDA or FSIS. In the first incident in 1997, elevated levels of dioxins were found in some farm-raised fish and poultry products. The levels in fish, poultry, and eggs during this incident were about 10 times higher than background levels. An investigation was quickly launched by FDA, FSIS, and EPA. That investigation discovered that a particular clay from one mine in Mississippi used as an additive to animal feed was responsible for the higher dioxin levels. The clay, which appears to be naturally contaminated, was immediately prohibited from use in any animal feed. The government is continuing to monitor these foods and will address any situations that are identified as a result of this monitoring.

Similarly, in 1999, elevated levels of dioxins were discovered in some Belgian animal products, and the source of the dioxins was traced to animal feeds from a particular source. The U.S. government stopped import of certain foods from a number of European countries until it could be either established that dioxin contaminated feeds were not used for the food, or that the food did not contain elevated dioxins. The levels of dioxins in this incident were a hundred or more times higher than what the current background levels are in similar foods in the U.S.

F8. What is the federal government doing to reduce dioxin levels in food? (return to list)

We recognize the need to continue to find ways to reduce dioxin levels in food. We have taken a number of actions to achieve this. The most effective way to reduce dioxin levels in food has been to reduce the level of dioxins released into the environment. EPA has taken aggressive actions to reduce and control dioxins in all environmental media by placing strict regulatory controls on all of the major industrial sources of dioxins. By 2002 industrial emissions will be reduced by more the 90% from their levels in the 1980's as a result of EPA's efforts, along with efforts by state government and private industry,.

In addition to reducing environmental levels of dioxins, we have been monitoring the levels in foods and conducting an investigation whenever a particular food has dioxin levels detected over the background levels in that food. If the investigation determines a specific source of the increased dioxins, we take actions to remove that source.

In addition to reducing environmental levels and monitoring foods, we are continuing our research efforts to better understand how dioxins get into the food supply and to identify ways for further reducing the level of dioxins in our food.

F9. Is it safe to nurse my infant? (return to list)

Yes, it is safe to nurse your infant. Many studies have shown that breastfed infants are healthier than formula fed infants. In fact, those studies were done years ago when the levels of dioxins in breast milk were higher than they are today.

The findings in EPA's draft dioxins report do not suggest that there are more dioxins in the environment than before; in fact, the report shows that levels in the environment continue to decrease. We believe there are overwhelming benefits of breast feeding and encourage women to continue the practice.

Further information about breast feeding (return to list)

Breast milk is known to be the most complete form of nutrition for infants, with benefits for infant health, growth, immunity, and development. The benefits of breastfeeding for children include fewer cases and less severity of diarrhea, respiratory infections, ear infections, and meningitis, among others. Breastfeeding may also reduce the risk of sudden infant death syndrome and may lower rates of childhood cancer.

In addition to the benefits for children, breastfeeding also has benefits for mothers. Breastfeeding has been shown to reduce postpartum bleeding, promote earlier return to pre-pregnancy weight, reduce the risk of breast cancer, and reduce risk of osteoporosis.

So again, the findings in the draft EPA dioxin report do not suggest that women should stop breast feeding. Women are encouraged to continue the practice of breastfeeding given its overall benefits to mother and child.

Risk assessment questions and answers (return to list)

The purpose of EPA's dioxins report is to estimate the potential for harm from dioxin exposure. EPA used a health protective approach to estimate the upper limits of potential exposure to and risk from dioxins, and described the risk for a small percentage of the population they assumed to be particularly susceptible to dioxins toxicity. The actual risk for the overall population is likely to be much lower than the findings described in the draft EPA dioxins report. The actual risk even for the susceptible population could be lower than the findings described in the draft report. Risk assessments like the EPA draft dioxins report are not intended to predict actual health risks for an individual or to tell us how often health effects will actually occur in the population. Assessments like this help us to compare risks and determine whether there is a need to reduce the potential risks identified. EPA made assumptions about things like whether exposures to workers in a factory are the same as exposures from food, and whether the higher doses received by factory workers for a short time tell us what would happen at the lower doses we get from diet over a long time. The approach used by EPA is standard practice among federal agencies.

R1. Why did EPA use health protective estimates in their draft dioxins report?
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The purpose of a risk assessment is to estimate the potential for risk from exposure to a particular substance -- in this case dioxins. EPA wanted a scientifically credible estimate of how high the possible risks from exposures to dioxins might be. The approach EPA used is the same as EPA and other federal and state agencies use for exposure to any chemical. For example, EPA made assumptions about how mixtures of chemicals behave in the body, about how data from animal studies and limited observations in groups of humans might relate to the general population, and about whether certain individuals in the population might be particularly sensitive to the exposure. Care was taken not to underestimate potential risk. The approach used by EPA is a commonly accepted practice in public health.

For more discussion of risk assessment and food safety see http://www.foodsafety.gov/~fsg/fsgfaq.html.

R2. EPA's report uses a health protective assessment, but what is the actual risk?
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We don't know what the actual risk from dioxins in food is. The draft EPA dioxins report presents an upper bound estimate of potential risk. The actual risk for most individuals is expected to be much lower. It is important to realize that assessments like EPA's are not intended to predict actual health effect risk for any one person, or health effect rates in the population. EPA used its best judgment with the available data and standard approaches in reaching its conclusions about potential risks; those judgments will be subject to independent, scientific peer review.

R3. In evaluating potential risks for the U.S. population, why did EPA use data from other countries? (return to list)

Dioxin is found in the environment around the world. EPA wanted to use all of the available data that is scientifically valid, no matter where the work was done. The EPA report primarily used North American data to estimate emission sources in our region, environmental levels, dietary levels and levels of exposure to the US population. In evaluating the effect of exposure on human populations or on animals, EPA evaluated studies from around the world. Again, because dioxin is emitted and exists around the world, data from other countries is important to consider in evaluating the potential risks from dioxin exposures.

R4. What are possible next steps for the Interagency Working Group on Dioxin? (return to list)

Currently, the interagency working group on dioxin is exploring the roles that the National Academy of Sciences (NAS) might play in furthering our understanding of the possible health impacts of dioxins in the food supply. In addition, once the EPA draft dioxins report has been peer reviewed and is final, we will have a better understanding of how to address these issues and the potential follow-up actions to consider.